## **CLAIMS**

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is as follows:

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1. A distributed method for processing auction traffic using one or more servers at a plurality of nodes in a distributed processing system comprising the steps of:

using a current local winner determination method at each of the nodes to quickly identify loser bids and candidate winning bids; and

using a current global winner determination method to determine from the candidate winning bids from each of nodes a current set of winners.

- 2. The method of claim 1, wherein the auction is an open-cry auction.
- 3. The method of claim 2, wherein the current local winner determination method comprises the steps of:

receiving a new bid(v,q) at a node, where v denotes the price per unit and q denotes the quantity desired;

checking to see if the new bid ranks in the top  $\lfloor N/q \rfloor$  bids, in terms of price/unit bid value, amongst all the bids asking for quantity q whose information is available to this process, where  $\lfloor x \rfloor$  stands for the greatest integer less than or equal to x;

taking the new bid/along with the set of  $\lfloor N/q \rfloor$  bids that have been processed and determining a new set of top  $\lfloor N/q \rfloor$  bids;

determining if bid(v,q) is in the top  $\lfloor N/q \rfloor$  bids and, if it is not, declaring it a loser bid, but if so, declaring it a candidate bid.

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1	4. The method of claim 3, further comprising the steps of:
2	holding the candidate bid at the node for a time, τ; and
3	if by time $\tau$ , through an arrival of another bid, a candidate bid loses its
4	position amongst the top $\lfloor N/q \rfloor$ highest bids, declaring the bid a loser bid;
5	otherwise, declaring the bid a winner candidate and making the bid
6	accessible for further processing by the current global winner determination
7	method.
1	5. The method of claim 4, wherein the current global winner determination
2	method comprises the steps of:
3	receiving new candidate winning bid from a node $bid(v,q)$ ;
4	taking the candidate winning bid along with the set of all bids that
5	have been processed and determines a new set of winners;
6	determining whether the new candidate $bid(v,q)$ is a winner or a loser;
7	and
8	notifying the bidder of bid $(v,q)$ as to whether they are a winner or
9	loser.
1	6. The method of claim 2, wherein the current local winner determination
2	method comprises the steps of:
3	receiving a new bid $(v,q)$ at a node, where $v$ denotes the price per unit
4	and $q$ denotes the quantity desired;
5	considering a set of bids using a set of pre-specified auction rules and
6	selecting winners for auctioning N+x copies of the item on sale; and
7	determinating whether the $bid(v,q)$ is a candidate winner bid.
1	7. The method of claim 6, wherein the current global winner determination
2	method comprises the steps of:

3	receiving new candidate winning bid from a node bid $(v,q)$ ;
4	taking the candidate winning bid along with the set of all bids that
5	have been processed and determines a new set of winners;
6	determining whether the new candidate $b(d(v,q))$ is a winner or a loser;
7	and
8	notifying the bidder of $bid(v,q)$ as to whether they are a winner or
9	loser.
1	8. The method of claim 1, wherein the auction is a descending auction.
1	9. The method of claim 8, wherein the current local winner determination
2	method comprises the steps of:
3	receiving a bid $(q)$ for processing, where $q$ is the quantity desired at
4	going price p;
5	determinating whether the bid is in the first $\lfloor R/q \rfloor$ bids, asking for
6	quantity q at price p, where $\lfloor x \rfloor$ stands for the greatest integer less than or
7	equal to $x$ and $R$ is a currently remaining quantity on auction;
8	if the bid is in the first $\lfloor R/q \rfloor$ bids, asking for quantity $q$ at the going
9	price $p$ , then declaring the bid a candidate winner bid; and
10	making the candidate winner bid available for further processing by the
11	current global winner determination method.
1	10. The method of claim 9, further comprising the steps of:
2	giving bids processed by the method a time stamp of arrival; and
3	determining whether the time stamp, if it exists on the bid, is greater
4	than or equal to the time stamp of any bid, asking for quantity $q$ at going price
5	p, that has been processed by the method in the past.

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